

## Enzymatic and mechanical extraction of virgin coconut oil

### ABSTRACT

The effect of different processing methods namely enzymatic method using crude protease extract (CPE) from overripe pineapple, microwave-assisted extraction (MAE) and ultrasound-assisted extraction (UAE) methods on the recovery yield of virgin coconut oil (VCO) is evaluated. The physicochemical properties of VCOs namely color, iodine value (IV), refractive index, saponification value, moisture content, free fatty acid, p-anisidine value, lipid peroxidation, fatty acid composition, triacylglycerol (TAG) composition, melting and crystallization profile are compared. The total phenolic compounds and scavenging activity of the extracted VCOs are also examined. Results reveal that enzymatic approach exhibits the highest VCO yield ( $77.7\% \pm 0.38$ ) at  $50\text{ }^{\circ}\text{C}$  for 2 h, followed by MAE ( $58.6\% \pm 0.07$ ), control without enzyme ( $24.1\% \pm 0.19$ ) and UAE ( $24.1\% \pm 0.12$ ). The physicochemical properties of the VCOs extracted are found to conform to APCC standards established except IV. The antioxidant activity of VCO extracted with CPE shows no significant difference with MAE and UAE methods ( $p > 0.05$ ). Lauric acid appears to be the most abundant fatty acid detected in all VCO samples. Similar exotherms and endotherms are observed in both melting and crystallization profiles with two distinct peaks exhibited. The TAG compositions of the extracted VCOs are mainly LaLaLa, LaLaM, CLaLa, CCLa, and LaMM (C = Capric acid; La = Lauric acid; M = Myristic acid).